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Packaging of cleaning products.

Cleaning products (e.g. soap tablets, powdered detergents) are packaged in a material which incorporates a fungicidally effective amount of a pyrrithione derivative, preferably zinc pyrrithione.

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The present invention relates to the packaging of cleaning products as well as to materials useful as packaging.

Examples of cleaning products with which the invention is concerned includes personal care products such as tablets of soap as well as domestic cleaning products such as detergent formulations for laundering or dishwashing purposes.

Various types of packaging are used for cleaning products. For example, soap tablets are wrapped in paper and as a further example detergent powders are packaged in cardboard boxes. As an additional example, liquid cleaning products (e.g. shampoos, dishwashing liquids) are sold in plastics containers. (The term packaging as used herein is also intended to cover such containers).

It has long been recognised that the components present in cleaning products encourage mould growth in or on the packaging material. Thus for example soap tablets generally have a relatively high moisture content and also contain fatty acids. This combination of moisture and fatty acids (which are mould nutrients) can lead to mould growth on the paper in which the soap is wrapped.

In order to avoid the problem of mould growth it has previously been proposed to incorporate a fungicide in the packaging material. One fungicide which has been used extensively for this purpose is Carben-dazim.

Carbendazim does however have a number of disadvantages. In particular, it is classified as a pesticide which places restriction on its use and moreover does not provide a sufficiently wide spectrum of activity to give total protection against mould growth.

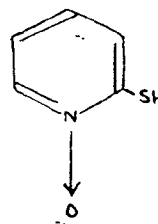
Another fungicide which has been used in packaging for cleaning products is TCMTB but this sensitises skin.

It is therefore an object of the present invention to obviate or mitigate the abovementioned disadvantages.

According to a first aspect of the present invention there is provided the combination of a cleaning product enclosed within packaging which incorporates a fungicidally effective amount of a pyrrithione derivative.

The cleaning product may for example be a solid product such as a tablet of soap (wrapped within packaging incorporating the pyrrithione derivative) or a detergent powder in a box formed of a material incorporating the pyrrithione derivative. Alternatively the cleaning product may be a liquid provided in a plastics container whereof the plastics material incorporates the pyrrithione derivative.

Pyrrithione is a compound of the following structural formula



Other names for pyrrithione include:

2-mercaptopyridine-N-oxide

1-hydroxypyridine-2-thione

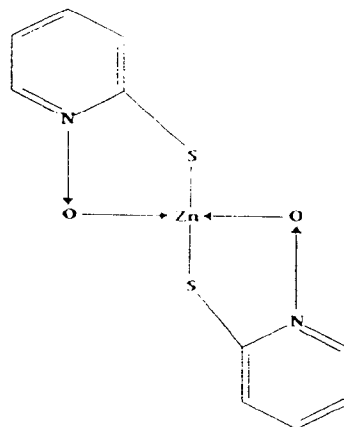
2-pyridinethiol-1-oxide

1-hydroxy-2(1H)-pyridinethione

Pyrrithione derivatives are used in a variety of personal care and cosmetic applications. Thus pyrrithione derivatives are used as antidandruff agents in shampoos. As such, they are recognised as being non-harmful to human beings and therefore their use (as fungicidal agents in packaging for cleaning products) is fully acceptable.

The pyrrithione derivative used in the invention is most preferably an insoluble derivative so as not to be "washed" off the packaging of the packaged cleaning product if the product is stored under conditions in which condensation is generated.

The preferred pyrrithione derivative for use in the invention is zinc pyrrithione which is of the formula:



This compound is available from Olin Corporation under the trade mark Zinc Omadine.

The pyrrithione derivative is preferably incorporated in the packing material in the form of particles having a size of less than 10 microns, preferably less than 5 microns. Preferably the packaging material comprises 250-2000 ppm of the pyrrithione derivative. The pyrrithione derivative may be incorporated in the base material of the packaging either during or after its production.

One example of packaging material is a non-woven cellulosic product, e.g. paper, cardboard or the like (such materials are particularly suitable for the packaging of solid cleaning products, e.g. soap tablets,

powdered detergents). The pyrrhione may be incorporated in the suspension of cellulose fibres from which the paper (or the like) web is formed. Alternatively the pyrrhione derivative may be applied after formation of the web, e.g. by incorporating the pyrrhione derivative in a solution (e.g. a thin starch solution) to be applied to the web at a size press, coating station or callender box.

Cellosic web materials incorporating a pyrrhione derivative are an important aspect of this invention in their own right and therefore according to a second aspect of the present invention there is provided a non-woven cellulosic material for use in packaging a solid cleaning product wherein the material incorporates a fungicidally effective amount of a pyrrhione derivative.

The invention will be illustrated by the following non-limiting Example.

Example

Two identical samples of paper were taken and one was treated with 750 ppm Zinc Omadine, the other being untreated to serve as a control.

The paper samples were then placed on nutrient agar, sprayed with a mixed fungal suspension, and observed over a period of six weeks for fungal growth.

The untreated paper was found to be completely overgrown by fungus after 1 week whereas there was no fungal growth on the paper treated with Zinc Omadine even after six weeks.

Zinc Omadine treated paper is therefore eminently suitable for use in wrapping soap tablets.

Claims

1. A solid cleaning product enclosed within packaging which incorporates a fungicidally effective amount of a pyrrhione derivative.
2. The combination as claimed in claim 1 wherein the pyrrhione derivative is an insoluble derivative.
3. The combination as claimed in claim 1 wherein the pyrrhione derivative is zinc pyrrhione.
4. The combination as claimed in any one of claims 1 to 3 wherein the pyrrhione derivative has a particle size of less than 10 microns.
5. The combination as claimed in any one of claims 1 to 4 wherein the packaging material comprises 250-2000 ppm of the pyrrhione derivative.
6. The combination as claimed in any one of claims 1 to 5 wherein the cleaning product is a solid prod-

uct.

7. The combination as claimed in claim 6 wherein the packaging material is a non-woven cellulosic product.
8. The combination as claimed in claim 6 or 7 wherein the cleaning product is a tablet of soap.
9. The combination as claimed in claim 6 or 7 wherein the cleaning product is a powdered detergent.
10. A non-woven cellulosic material for use in packaging a solid cleaning product wherein the material incorporates a fungicidally effective amount of a pyrrhione derivative.
11. The combination of a solid cleaning product enclosed within packaging substantially as hereinbefore described.



European Patent
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PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention EP 94 30 7360
shall be considered, for the purposes of subsequent
proceedings, as the European search report

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	FR-A-2 016 071 (MOSINEE PAPER MILLS COMPANY) * page 23, line 34 - line 39 * ---	1-3,6-8, 10	B65D81/28 D21H21/36
Y	PATENT ABSTRACTS OF JAPAN vol. 16, no. 273 (C-0953) 18 June 1992 & JP-A-04 069 301 (OHYAYASHI CORP.) 4 March 1992 * abstract * ---	1-3,6-8, 10	
A	US-A-3 270 022 (WAKEMAN ET AL) * column 3, line 71 * ---	1	
A	DATABASE WPI Week 9303, Derwent Publications Ltd., London, GB; AN 93-019003 & DE-A-41 22 654 (BAYER AG) 14 January 1993 * abstract * -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65D D21H
INCOMPLETE SEARCH			
The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims Claims searched completely : 1-10 Claims searched incompletely : Claims not searched : Reason for the limitation of the search: 11 EPC Rule 29(6)			
Place of search		Date of completion of the search	Examiner
THE HAGUE		20 January 1995	Smith, C
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